

# SAFER, GREENER, CHEAPER: The Mooncup and the Development of Menstrual Cup Technology in the Twentieth Century

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*When the Mooncup® menstrual cup was launched in the United Kingdom in 2002, it joined a history of innovations that began in the 1900s.<sup>1</sup> Like other commercialised menstrual products, such as disposable pads and tampons, the menstrual cup sits at the crossroads of medical device safety concerns, environmentalism, and economic debates surrounding 'period poverty.' Analysing how and when the brand emerged in the longer history of menstrual cup technology, this paper asks what it means for menstruating bodies to utilise the menstrual cup as a technology during its re-emergence as a novel and increasingly popular control mechanism for menstrual blood leakage. Specifically, this paper considers how the silicone properties of the Mooncup made it a viable commercial technology where other visually similar, but materially different, cups had failed in terms of popularisation. To do so, the article draws on an interview with a company employee, materials relating to the regulation of the cup, and literature from Critical Menstruation Studies. Situating it in menstrual technological history and within the specifics of the Mooncup product helps both broaden the historiography of menstrual cups, and reveals how this technology was developed during the twentieth and twenty-first centuries.*

Every month, an increasing number of people around the world fold and insert a transparent bell-shaped medical-grade silicone device into their bodies to collect menstrual blood. Once inside, it can stay for up to eight hours, until the user breaks the suction seal with their fingers and removes it. After emptying the blood, rinsing the device, and washing their hands, it is inserted again for another eight-hour cycle. In the words of one cup user, the cup eliminates the need “to worry,” makes it easier to manage “heavy flow days”—things that for some were lifechanging: “Getting a cup has changed my life, no lie. I used to DREAD my period, especially on heavy flow days, but now I don’t have to worry . . .”<sup>2</sup> In contrast to older and market

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1 All references to Mooncup refer to the registered trademark, but the symbol will be omitted.

2 User review of mooncup by “Jennie.”

dominating menstrual technologies such as single-use pads and tampons, the cup is not discarded after use but cleaned and stored. One single cup can be used for every cycle of the year, for several years, even decades. When used correctly, manufacturers argue, it is a safer, more environmentally friendly, and – in the long term – a cheaper investment than any other menstrual management system available today. Two studies from 2019 have assessed these claims positively, finding that cups have less environmental impact than single-use options, and that they are safe options in terms of acceptability, leakage, availability and use.<sup>3</sup> With the exception of foregoing products entirely through free-bleeding or hormonal contraceptive use (both associated with costs other than price), cup manufacturers argue that their device has a small environmental impact.<sup>4</sup> But the cup solution depends on a variety of factors, including ability, infrastructure, access to water, sanitation systems, and personal attitudes towards handling blood, inserting objects into the body, and individuals' menstrual cycle and finances.<sup>5</sup> The specific production, material and design of a cup can make a great deal of difference to users, and warrants close analysis and attention from menstrual cycle scholars and consumers alike.<sup>6</sup>

While not a new invention, the popularity of menstrual cups has risen substantially in the 2000s.<sup>7</sup> But not all cups are the same. Amongst the more prominent brands, the 2002 British brand Mooncup has gained in popularity and media coverage.<sup>8</sup> While scholars have explored the reasons why the menstrual cup has become so popular, it is the technology of medical-grade silicone which has ensured the cup's success and role in "innovating menstrual organisation" by "redistributing boundaries, capitals, and labour."<sup>9</sup> As the first cup to utilise medical-grade silicone, the Mooncup revived an older rubber-based technology for the twenty-first century.

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- 3 Hait and Powers, "Value of Reusable Feminine Hygiene Products," 104422; van Eijk et al., "Menstrual Cup." It should be noted that van Eijk et al calls for further studies on cost-effectiveness and environmental effect comparing different menstrual products.
  - 4 On menstrual management more broadly: Bobel, *Managed Body*.
  - 5 Pokhrel et al., "Acceptability and Feasibility"; Sommer and Sahin, "Overcoming the Taboo."
  - 6 Stewart, Greer, and Powell explored the brand in terms of user acceptance and leakage ten years ago, finding then that 55% of the participants would carry on using the Mooncup, concluding that the brand was acceptable for most women: "Women's Experience."
  - 7 Allied Market Research, *Menstrual Cup Market by Product Type (...) 2019-2026, 2020* (this report is expensive, but Allied Market Research makes some results available for free on its website for those interested).
  - 8 Allied Market Research, *Menstrual Cup Market by Product Type*.
  - 9 Owen, *Innovations in Menstrual Organisation*.



Figure 1. A Mooncup® menstrual cup 2021.  
(Courtesy of Mooncup®.)

This article documents the history of Mooncup’s technology, making the claim that the brand’s pioneering use of silicone material and manufacturing practices greatly shaped the modern menstrual cup market by making cups available to more people. It draws on an interview with Mooncup Ltd. company director Kath Clements, who was part of the company from the start. He was able to share the origin story of the product, changes to manufacturing, and details of the company’s technological changes.<sup>10</sup> It was not possible to interview other company staff due to their relatively small number and the COV. As such, the article utilises historical literature, including documentation about the Mooncup from the Food and Drug Administration (FDA) and menstrual technology scholarship to analyse the cup’s position in history. Furthermore, it explores the role of the product as a specific technology, analysing it through frameworks of Critical Menstrual Studies and feminist Science and Technology Studies (STS), in particular Elizabeth Neswald’s theory of ‘unremarkable’, mass-produced, yet highly personalised medical-device affiliated technologies.<sup>11</sup> With a rise in sales of 98 per cent in the past five years, the success of the brand deserves attention at a time when the Mooncup began

10 I met with Clements in person in Bristol, UK, in spring 2020, in order to get acquainted and request a more formal interview. Later, I recorded a one-hour interview with Clements online (4 May 2021). In advance, she had been sent the questions, and we planned the outline of the interview via email. Mooncup® has around 14 employees overall, based in Bristol and online. I utilised a semi-structured interview methodology, focused on the technology of the device throughout. I used the recording and the transcription of the interview for this article. (Clements, interview by author, 4 May 2021, via Zoom.)

11 Neswald, “Things That Don’t Talk Much”; 634.

challenging other menstrual technologies for the first time.<sup>12</sup> Why did the Mooncup succeed where other brands of cup failed?

## Frameworks

As technologies at the crossroads of menstrual health, environmental campaigning, consumer choice, and economic debates surrounding ‘period poverty’, menstrual artefacts have impacts both on the individual and society.<sup>13</sup> But compared to single-use pads and tampons, cups stand out due to their positive embrace in the 2000s by environmentalists, governments, and charities alike. This made the menstrual cup both a symbolic and practical solution for menstrual management at the turn of the twenty-first century.<sup>14</sup> While both social justice issues and individual menstrual management choices have been key to this development, the Mooncup®’s ability to take on the ‘cult-like status’ that it has would not have been possible without the company’s initial focus on material and manufacturing.<sup>15</sup> As the first medical-grade silicone cup, the Mooncup was visually similar to past competitors, but materially unique. Exploring the technological history of the cup therefore underscores the Mooncup how technological factors in turn impacted the social and public perception of the cup.

Critical Menstrual Studies and feminist STS both offer unique insights to the issue of menstrual technology history and development, and are usefully brought together here in order to ensure a holistic approach to researching the particulars of the Mooncup brand. Critical Menstrual Studies, while recently coined, has a long history of deep scholarly engagement with all aspects of the menstrual cycle.<sup>16</sup> Within this tradition, a historical approach contributed greatly to knowledge about menstrual technology development and the prevalence of brands, companies, start-ups and corporations in the international public imagination of menstruation.<sup>17</sup> Here, a critical approach to the commercialisation of menstruation through products

12 Jenny Stevens, “‘People were revolted’: How Mooncup® bust Period Taboos and Built a Big Success,” *Guardian*, 24 October 2019; London Assembly, Environment Committee, “Single-Use Plastics: Unflushables,” August 2018, 7.

13 Vostral, *Under Wraps*

14 London Assembly, Environment Committee, “Single-Use Plastics: Unflushables”; Women’s Environmental Network, “Environmenstrual,” 2021, <https://www.wen.org.uk/our-work/enviro-menstrual/>; on feminist, environmental and anti-racist organisations’ work to disseminate cups in the Global South: Bobel, *Managed Body*.

15 O’Donnell, “Whole Idea Might Seem a Little Strange.”

16 Bobel et al. eds., *Palgrave Handbook*.

17 Vostral, *Under Wraps*; Freidenfelds, *The Modern Period*; Kissling, *Capitalizing on the Curse*; Malmberg, *Skammens Røda Blomma?*

was influenced by feminist and Marxist economic theory. The field seeks to provide a counterweight to otherwise strong assumptions about the naturalness of products such as tampons and pads by defining and questioning the current paradigm of concealing menstruation.<sup>18</sup> In terms of the Mooncup, the field has yet to provide a more thorough investigation of the brand and its technology, although the recent increase of research about the menstrual cup as a phenomenon is helpful in setting out what the cup means to consumers across the world.<sup>19</sup> The discipline provides a useful guiding question for this article: what is the Mooncup's historic role in the history of menstrual management and product development?

Within STS, feminist interventions have called attention to the ways in which gendered products and innovation challenges both the scholarly field and the tech sector more broadly. Items such as breast pumps, hormones, birth control, silicone breasts, and pregnancy test have all been designed with specific genders in mind, and specific views about women in particular.<sup>20</sup> Likewise, STS scholars have examined the design and development of tampons and pads in particular, exploring the intersecting biological, technological, and corporate influences on the menstruating body.<sup>21</sup> The first STS studies of the cup focused on the first generation of rubber menstrual cup technology and the Tassette and Tassaway brands.<sup>22</sup> Yet, the Mooncup—despite its technological innovation as a silicone device—has not been examined in detail by STS scholars until now. The article takes its second framing question from this discipline: how have choices regarding materials, technology, and manufacturing shaped the Mooncup®'s place in menstrual technology development?

## A Disruptive Technology

In her landmark study of menstrual products in the United States, *Under Wraps*, Sharra Vostral first claimed that items such as tampons and pads should be understood as technologies.<sup>23</sup> When menstrual products failed, she noticed, people tended to see it as a moral rather than technological failure.<sup>24</sup> Manufacturers of products, however, have tended to foreground the technological aspects of their products and left the cultural and related debates as an afterthought. Yet they are

18 Delaney, Lupton, and Toth, *The Curse*.

19 van Eijk et al., "Menstrual Cup."

20 Obladen, "Guttus, Tiralatte and Téterelle"; Preciado, *Testo Junkie*; Perry and Frame, "History and Development"; Murphy, *Seizing the Means of Reproduction*.

21 Vostral, *Under Wraps*.

22 O'Donnell, "Whole Idea Might Seem a Little Strange."

23 Vostral, *Under Wraps*, introduction.

24 Vostral, *Under Wraps*, 2.

clearly entwined: when menstrual products are advertised by soaking them in blue liquid, the manufacturers sincere focus on documenting superior absorption (within the context of strict media censorship forbidding the use of red) was largely lost on the consumer—who questioned the intention behind the choice of colour.<sup>25</sup>

Yet menstrual cups have always had to straddle the techno-cultural and ethical boundaries of business. As with other menstrual technologies, a cup is never just about technology. A cup is a gateway for a new type of relationship to the body. It lets users get closer to their cycle and blood, as removal and insertion necessarily include touching of one's own body and contact with some blood.<sup>26</sup> It allows consumers to see how much they bleed, easily measured by the marked lines on the cup.<sup>27</sup> In financial terms, the cup reshapes consumers purchasing habits from monthly to decade-based. For all these reasons, the silicone menstrual cup was a disruption of the menstrual market, menstrual norms, and histories of menstrual technology. While the cup itself contributes to the invisibility of menstrual blood in public (like all menstrual technologies), it gives consumers a real alternative to dominant options and challenges the status quo of tampons and pads.

A disruptive innovation is one that creates a new market and value network, eventually disrupting an existing market and displacing established products and brands.<sup>28</sup> Where other technologies have failed, will the Mooncup be the technology to ultimately disrupt the menstrual market in this way, eclipsing the popular single-use products of multi-national corporations such as P&G, Kimberly-Clark and Essity? Is the Mooncup akin to the first automobiles, which certainly changed the market but did not disrupt horse-drawn vehicles when they were adopted? Or are they more akin to mass-produced cars, which changed transportation forever.<sup>29</sup>

In general, the menstrual cup is an excellent 'thing to think with.'<sup>30</sup> It challenges technology, consumers, habits, and taboos. It is an everyday (or, everymonth) object that is mass-produced, anonymous to some, and highly significant to others. In Elizabeth Neswald's proposed material culture methodology for medical devices (her focus is the blood glucose monitor) she underlines the potential and limitations of studies of medical devices that are in themselves 'unremarkable.'<sup>31</sup> Menstrual cups

25 Vostral, "Toxic Shock Syndrome."

26 Owen, *Innovations in Menstrual Organisation*, 144.

27 However, in their study of the brand, Stewart, Greer and Powell note that the Mooncup is acceptable for most users, but "could not be used for the objective measurement of menstrual blood loss because of the leakage that did occur" ("Women's Experience," 285).

28 Christensen et al., "Disruptive Innovation."

29 Christensen et al., "Disruptive Innovation."

30 Daston, *Things That Talk*.

31 Neswald, "Things That Don't Talk Much," 634.

(like blood glucose monitors), are both intensely personal, mass-produced, relatively cheap everyday products that have historically not been privileged by students of material culture. Taboos may also have played a role in this neglect, seen also in the relatively late theorisation of tampons and disposable pads.

While being mass produced, items like blood glucose monitors and menstrual cups become highly individualised once entering into a working relationship with a body. Many menstrual cups are literally and figuratively transparent, built to give individual consumers more information about their body. With inbuilt measuring lines, users can track how much blood is lost every day—that is, up to the limit set by the size of the cup. In a world where standards for normal and abnormal menstrual blood loss is still quite unclear, this information can be vital for those with underlying conditions, or anyone simply curious about their body. Likewise, the clear silicone used in the Mooncup leaves no choice for the user to look away from blood. The cup's lack of colour brings out the bright red colours of the collected blood, which eventually stain the silicone over time. In comparison to pads and tampons, it is difficult to use this technology without engaging directly with blood, or at the very least feeling or seeing it. In comparison to black box technologies, the cup is not inscrutable, revealing instead parts of its own and the body's internal workings. Yet, the technology is also created to be used in the bathroom, and thus deferring to the already existing societal habits regarding managing menstruation in a private and discreet manner.

Once inside the body, the cup is perhaps more of a traditional menstrual technology. As made clear in the consumer review that began this article, some users feel that the cup absorbs “the worry” of menstruation, making it truly invisible, private, and manageable. Success is defined as keeping menstruation hidden. As such, the cup straddles boundaries between information and obscurity, offering the user some data, while still rendering menstruation a mostly invisible and private experience. In Neswald's writing, she posits a theory of things that talk and things that don't (following Lorraine Daston's influential theory about objects that generate knowledge and conversation through “talking”).<sup>32</sup> But not all objects “talk” all the time, Neswald notes. Likewise, the cup is silent most of the month, and silent while in the body. The data it provides is reduced to blood loss only. While this can be an important marker of health, it does not fully gather or express the full status of the user's menstrual health to the user nor the world.

Menstrual products in general uphold the social etiquette that renders menstruation a private – rather than public – affair.<sup>33</sup> Items made to be ‘used, not

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<sup>32</sup> Daston, *Things that Talk*, introduction.

<sup>33</sup> Daston, *Things that Talk*, 9-24.

admired' face a strange paradox when momentarily admired.<sup>34</sup> The Mooncup is a case in point. Created for a specific purpose, the brand soon became a symbol of much larger debates: feminist approaches to menstruation; the rise of Period Poverty activism; Critical Menstrual Studies; debates in Scotland and Kenya at the highest levels of law and politics; on TV; in films; on T-shirts. The cup, created to restrain one bodily fluid, was suddenly a symbol of progress, an object given new life through layers of semiotics from media and creative interest. The object itself had not changed, nor had the company behind it changed the way they spoke about their technology or operated. As in the start of menstrual cup development, Mooncup continued to promote the object based on feminist eco-consciousness. The name ("moon") also underlined this commitment, linking the brand to the longer history of feminist spirituality and even New Age religious movements.<sup>35</sup> As such, the product became a 'thing that talked loudly', but very seldomly about the technology at the heart of its original conception and growth. Indeed, the Mooncup was a pioneering menstrual cup in terms of its materials and manufacturing processes. Its history demonstrates the pioneering role of consumer-inventors in this history. A crucial part of the story was its brief history as a medical device, and the ensuing FDA regulation of the cup.

### Reinventing the Menstrual Cup

The menstrual cup is not new. Rather, it is a type of technology that perfectly underlines the ways in which the perception and use of technology changes in relation to underlying intellectual paradigms. In terms of the cup, the most relevant paradigms revolve around waves of feminism and environmentalism, and the commercialisation of menstrual products and gendered items more broadly. When each of these paradigms were strong—as in the 1970s and the 2010s—the cup was able to transgress pervasive Western societal norms such as the "menstruation concealment imperative" and the paradigm of using disposable menstrual products.<sup>36</sup> The cup appeared, disappeared, and re-appeared throughout the twentieth-century, always intersecting with contemporary feminist ideas and new thinking about menstruation. Each phase also coincided with material and technological innovations.

It can be argued that the cup has enjoyed three waves of development, uneven commercialisation, and popular culture impact. Historian Kelly O'Donnell has provided valuable historic documentation about the key inventors and brands from the twentieth-century.<sup>37</sup> O'Donnell tracked the first appearance of the menstrual

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34 Neswald, "Things That Don't Talk Much."

35 Bobel, *New Blood*, Chapter 4: Feminist-Spiritualist Menstrual Activism.

36 Wood, "(In)Visible Bleeding."

37 O'Donnell, "Whole Idea Might Seem a Little Strange."

cup to the 1930s, when the North American Tassette brand was unsuccessfully sold as a reusable, cheaper and less bulky option than tampons and pads. The inventor was American actress and author Leona Watson Chalmers, whose 1937 book *The Intimate Side of a Woman's Life* instructed female readers about vaginal and bodily cleanliness within the context of marriage, including extensive marketing for the Tassette itself.<sup>38</sup> Chalmers' invention was made from soft rubber, and was one of many 'catamenial cups' patented in the 1930s, none of which could compete with the rise of applicator tampon Tampax, invented in 1936. In the mid-twentieth century, Chalmers tried to compete, buying advertising space in several magazines. An *Ebony* campaign from 1962 claimed that vaginitis was the number one female disorder in America and that only Tassette could help.<sup>39</sup> Given the large, international advertising campaign around Tampax, it is perhaps unsurprising that the Tassette could not compete.<sup>40</sup>

In 1959, Chalmer sold her invention to a businessman whose wife tried the invention and was convinced that the technology worked, resulting in Tassette Incorporated.<sup>41</sup> The company lasted ten years. The Tassette was in part too good value for money, offering no repeat sales and no chance of expansion. Instead, a disposable version – the Tassaway – was developed by the 1970s and logged with the FDA soon thereafter. This new product was aimed at a large market, including Europe, with an advertising budget that included televised and print campaigns. But consumers understood that the technology could be hacked, and those who remembered Tassette simply began using Tassaway in a similar manner. In one of the first popular books about menstruation, *The Curse: A Cultural History of Menstruation* (1988), the authors describes reusing Tassaway with enthusiasm.<sup>42</sup>

Meanwhile, Tassaway relied on many longstanding tropes about menstruation to attract new consumers. Advertising campaigns from 1971 mention the product's ability to solve the problems of menstrual smell and inconvenience. This meant that "you never have to worry about accidents."<sup>43</sup> Much later, Proctor & Gamble's Toxic Shock Syndrome-related tampon Rely would use the tagline "it even absorbs the

38 Harry Finley, "The Intimate Side of a Woman's Life," Museum of Menstruation, 2006, <http://www.mum.org/intima.htm>.

39 "Mail coupon to Mrs Leona Chalmers and Tassette for the booklet 'an intimate side of a woman's life'," *Ebony*, November 1959, 148; "Disorder affecting 20 million women... The disorder which doctors call Vaginitis is now the number one female disorder in America! For the health and happiness of your marriage you should know the just published facts about Vaginitis," *Ebony*, September 1962, 120.

40 Bailey, *Small Wonder*.

41 O'Donnell, "Whole Idea Might Seem a Little Strange."

42 Delaney, Lupton, and Toth, *The Curse*, 140.

43 "Tassaway advertisement," *Ebony*, October 1971, 56.

worry!”, underlining the decades long sales strategy in which menstrual product manufacturers promised an almost invisible menstrual period.

Despite its ambition and aggressive marketing, the Tassaway company folded in the early 1980s.<sup>44</sup> The story of the failed Tassette and Tassaway became a cautionary tale for anyone seeking to develop new menstrual technologies, including those who sought to fill the gap in the market that the Tassaway Incorporated company had left.

### **From Silicone to Latex and Back**

Lou Crawford was one of the disappointed former Tassaway users looking for a better menstrual management alternative in the early 1980s.<sup>45</sup> Like Chalmers, Crawford was both a consumer and inventor of cups. By 1987, she had manufactured the first latex rubber cup, naming it *The Keeper*.<sup>46</sup> Two years later, Crawford introduced the important innovation of different cup sizes depending on whether or not the user had given birth. This meant a more complicated manufacturing process, and additional use of rubber. Cup size A and B differed by only three millimetres, but made it possible for more consumers to find a comfortable fit, and was one of several key innovative moments in menstrual cup technology.<sup>47</sup> In comparison to Tassette and Tassaway, *The Keeper* company did not collapse and its cups are still available to buy today. The company has slowly increased its reach around the world, relying on word-of-mouth advertising and health food shops to reach its target demographics.

Following travel in Australia in the 1990s, Su Hardy first trialled menstrual cup technology through *The Keeper* brand. Like Crawford before her, Hardy was an instant convert, though she noted that there was room for improvement for customers with latex allergies. She developed the idea further by researching materials that would be convenient also for those with latex allergies. The debate about latex allergy was intense at the time, marked by the first anaphylactic reaction caused by latex surgical gloves in 1984 and the first death in 1991.<sup>48</sup> While irritation and reactions to latex had been reported before, reports of dangerous and immediate consequences surged in the 1990s. In part due to this, medical-grade silicone was increasingly used for intimate care, for instance in baby bottle nipples and in prosthetics. Hardy was a young mother at the time, already interested in the

44 O'Donnell, “Whole Idea Might Seem a Little Strange.”

45 O'Donnell, “Whole Idea Might Seem a Little Strange.”

46 Donald McNeil, “Menstrual Cups, at Age 66, Begin to Make up for Lost Time,” *New York Times*, 4 February 2003.

47 Harry Finley, “A History of the Menstrual Cup (continued),” Museum of Menstruation, 2006, <http://www.mum.org/CupKeep.htm>.

48 Ownby, “History of Latex Allergy.”

technologies of babyhood and reproduction, where silicone was already making inroads. Informed by her own use of reusable diapers, she also understood that reusable products needed to be cleaned effectively, safely, and quickly by users.<sup>49</sup> She began researching potential materials for a new type of cup, and landed on silicone due to its flexibility, hypoallergenic qualities, durability, and relative ease of cleaning through boiling.<sup>50</sup>

In this way, Hardy was part of a history of menstrual product hacking, tweaking and engineering in which consumers became inventors, and, sometimes, manufacturers. Hardy used and updated The Keeper to appeal to more consumers. While tampons and pads were substantially altered during the same decades, they were generally only changed within the spheres of multi-national corporate laboratories rather than by consumers. Cup technology seemed to invite users to tweak, hack, and improve it. In turn, tweaks could become patents, and patents a new business. By 2002, Hardy had founded the Mooncup company back in her native England, starting a modest production line for silicone menstrual cups.

## Silicone Valley

During the 1990s, medical grade silicone was increasingly available for internal bodily devices, most famously in breast implants. The use of silicone in products such as condoms, contact-lenses, and testicle implants meant that there was already an extensive testing and research base from which to understand the materials on and inside of the body. The heated media debate about breast implants in particular had also raised awareness of the potential and limitations of silicone use in the body.<sup>51</sup> The very notion of ‘plastic’ surgery seems to link silicone to the twentieth-century narrative about petroleum production and use, as well as the concept of throwaway society (a term invented in the years after the first implants), although the ‘plastic’ really refers to the etymology of the Greek *plastike* as in ‘reshaping.’<sup>52</sup>

No doubt, makers of silicone learnt a lot from the decades of silicone implants and their troubled relationship to media, feminists, and consumers. While problems with breast implants were rife, the silicone within them was seldom tied exclusively to health issues— rather, question marks about the value of breast implants and the psychology of those who wanted them were raised, as the media focus followed

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49 Stevens, “People were revolted’.”

50 Clements, interview.

51 Breast implants consist of elastomer silicone shells filled with sterile saline solution, and were first invented in 1961 by American plastic surgeons Thomas Cronin and Frank Gerow.

52 Freinkel, *Plastic*.

celebrities and users whose implants ruptured or otherwise physically failed.<sup>53</sup> From breast implant technology and other internal uses of medical-grade silicone, manufacturers learnt that the material was durable to a point.

For all these reasons, silicone was an obvious candidate for the cup. It broadened the consumer base to include those with latex allergies and those who were latex-septic. In addition, Mooncup benefitted from the medical and media discourse surrounding the safety of silicone, relying on decades of research into the safety and efficacy of the material. While the ten-year use model was not a typical sales strategy, the potential number of millions of menstruators around the world made the business viable. As such, the first step in establishing the Mooncup would be to source silicone.

In order to understand the innovation made by Mooncup, we need to detour into the multi-faceted, colourless, rubber-like world of silicone, or, polymerized siloxanes. Consisting of an inorganic silicon-oxygen backbone chain (-Si-O-Si-O-Si-O-), silicones can be synthesized with a variety of compositions. They can be liquids, gels, oils, and hard materials, making them a popular and pervasive material throughout the industrialised world. After silicone was first defined by English chemist Frederic Stanley Kipping in 1901, entrepreneurs began experimenting with the material's suitability for proximity to the body. They found that silicone devices had low chemical reactivity, low toxicity, thermal stability, the ability to repel water, resistance to microbiological growth, resistance to oxygen, and resistance to UV light. Soon, this exciting material could be found everywhere, including electric systems (insulation), electronics (coatings, keyboards), household (cooking utensils), in cars, airplanes, and in medicine.

Throughout the late-twentieth century, silicone made its way into an increasing numbers of technologies and body parts. Realising its potential, entrepreneurs used silicone in their sexual lubricants and condoms, in hair conditioners, baby bottle teats, and in shaving products. By 2002, the inclusion of silicone in menstrual cup technology was therefore part of a global production chain worth billions and growing sharply all the while.<sup>54</sup>

53 Matthieu Protard and Richard Lough, "French Court Orders Damages for Victims of PIP Breast Implant Scandal," *Reuters*, 20 May 2021, <https://www.reuters.com/world/europe/french-court-victims-pip-breast-implant-scandal-should-be-compensated-2021-05-20/>.

54 Around the turn of the twentieth-century, a not-for-profit umbrella structure for the industry named the Global Silicone Council was founded to promote the safety of silicones from a health, safety, and environmental perspective. Medical-grade silicone items are usually made by pouring liquid silicone rubber into custom moulds ("Wholesale Menstrual Cup Development," Casco Bay Molding, December 2021, <https://www.cascobaymolding.com/wholesale-menstrual-cup>). Even if medical-grade silicone doesn't contribute to the toxic silicones found in nature, both the creation of the material and the eventual disposal of the product has environmental footprints.

## Manufacturing the Mooncup

The manufacturing process of the Mooncup has shifted over time. In the start, cups were created through the process of compression moulding, which was labour intensive and relied on humans rather than machines or robots.<sup>55</sup> As demand increased in the late 2000s, production methods changed in response. Furthermore, the compression technique used to make the first cups from medical-grade silicone would create seams where the two halves of the cup were attached, which could be uncomfortable for users if the seam rubbed against the vagina. Mooncup also sought ways to decrease the waste from the cut-offs of the compression system. Based on demand and the issue of the seam and wastage, Mooncup moved to injection moulding manufacturing in 2010. This system used liquid silicone for moulding, resulting in less waste, and the total elimination of seams.

At the same time, Mooncup changed the curing process of the cup's silicone from peroxide to platinum. Curing is the process that changes the silicone's chemistry as it is exposed to oxygen and dried slowly. It was a lengthy process, only made longer by the switch to platinum. Peroxide had the benefits of lower curing temperatures, a longer shelf life for the product, being cheaper, and having been tested over decades. It also, however, created a less transparent product and could be sticky to work with.<sup>56</sup> Platinum curing, in contrast, made the resultant silicon products clearer, was less sticky for users, produced better tear strength, and was viewed as slightly cleaner by the Medical sectors. However, the new process was also more expensive, harder to process, relied on high temperatures, and had a shorter shelf life.<sup>57</sup> Overall, the manufacturing process rendered the Mooncup and its manufacturers "partners and pioneers" in the development of better cup technology.<sup>58</sup>

While the Mooncup's manufacturing process was altered, many aspects remained. Each cup had measurement markings that showed exactly how much blood was collected. This tool offered information to consumers, and underlined the fundamental technological difference between cups and other menstrual technologies: they collected rather than absorbed blood. Holes around the cup's ridge helped when removing the cup by releasing the suction seal that kept the cup inside the body. The stem at the bottom of the product was kept long, and was designed to be tweaked and trimmed by users with scissors. In fact, the new manufacturing process made the suggested lines for trimming the stem more visible, guiding users while making clear that each body required different stem lengths for

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55 Clements, interview.

56 "Difference between Platinum and Peroxide Curing?," Silicone Engineering Ltd, December 2021, <https://silicone.co.uk/news/difference-platinum-peroxide-curing/>

57 "Difference between Platinum."

58 Clements, interview.

comfort. Similar to The Keeper, the Mooncup was made in two sizes: one for those over thirty and anyone who has given birth vaginally, and a smaller size for everyone else. The brand name was added to the Mooncup when the manufacturing process changed, to avoid confusion with competitors (although this still happened). The change in the company's curing process meant that the cup was slightly clearer, so that blood and mucous could be easily seen and that stains would build up over time. Since Mooncup is a vegan brand, dyes to hinder staining were never added, and the question as to whether or not consumers would accept the staining were raised but quickly dismissed. The Mooncup team argued that the cup was 'simply attractive just the way it is.'<sup>59</sup> In the tradition of cup development history, not all users were interested in their blood being visible, and some wanted alternatives. For example, a new Finnish brand, Lunette, concealed stains. These material and manufacturing changes coincided with a period when the FDA took a momentary interest in regulating the cup in the United States.

## Regulating Cup Technology

The menstrual cup was and remains unevenly regulated across the world. Since the Tassaway, the FDA has classified menstrual cups as Class II medical devices, and it therefore provides some limited historic data from a regulatory perspective where other regions and countries had none. Since the FDA started classifying the cups as Class II medical devices, groups and individuals have had access to paperwork about manufacturing and safety. They often engaged with the regulative aspects of cups. For instance, in April 2003, the Associated Pharmacologists & Toxicologists of the United States drafted a Citizen's petition to the FDA and Commissioner of Food and Drugs Dr Mark McClellan regarding potential links between endometriosis (a disease of the female reproductive system) and cup use.<sup>60</sup> Written one year after the launch of the Mooncup in the United Kingdom, and with only two products in the American market (The Keeper and Softcup), the letter came at a time when toxicologists and other experts were taking more interest in menstrual cups than before. The letter asked the FDA to 'revoke the approval for the marketing of the devices categorized as menstrual cups because there is a high likelihood that the use of these devices as directed will endanger a woman's reproductive health by inducing endometriosis.'<sup>61</sup> They asked for the ban to be upheld until the companies

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59 Clements, interview.

60 "Citizen Petition," Associated Pharmacologists and Toxicologists, 17 April 2003, archived via Internet Archive, <https://wayback.archive-it.org/7993/20171102230355/https://www.fda.gov/ohrms/dockets/dailys/03/Apro3/04r803/80063baa.pdf>

61 "Citizen Petition."

selling cups could submit animal and clinical data to support their safety claims, and warned that ‘obstructions of the cervix and vagina are commonly recognized as important factors in inducing endometriosis.’<sup>62</sup> Comparing the impervious, non-absorbent materials of menstrual cups to the absorbent tampon structure, they argued that when tampons were saturated, menstrual fluid exited the body, whereas saturation of the cup resulted in menstrual fluid remaining in the body (known as reflux).<sup>63</sup> Furthermore, as the user moved, reflux could increase, especially in the case of the Softcup, which was recommended during sexual activity, worn high up in the cervix, and often utilised by young athletes.

The letter’s, focussed as it was on the Keeper and the Softcup cups, however, disguises different company’s use of different materials and different body placement. While all cups sit in the vagina to collect blood, the Keeper was rubber-based whereas the Softcup was plastic and diaphragm shaped. Furthermore, the Softcup was placed on the cervix, whereas the Mooncup was designed to be worn with space between its rim and the cervix, sitting much lower in the body. As technologies, the different cups they had little in common other than collecting blood from inside the body, yet the consequences of this and other concerns about cups in general had an immediate effect on all brands. While acknowledging the complexity of the issue and the long time needed to develop the painful condition of endometriosis, the letter concluded with a recommendation that cup users should be informed of the possible risk of endometriosis associated with these products. The letter writers argued that the FDA should ask for more data and scientific detail before accepting any cups onto the market.<sup>64</sup> The 510k premarket notification category for Class II devices in part asked for such details.

Being classified in Class II with 510k premarket notification meant that brands had to supply full quality assurance, produce a declaration of conformity, affix certification marking, and prepare detailed technical documentation as they entered the U. S. market.<sup>65</sup> The FDA required this in order to ‘protect the American consumer when interacting with a medical device,’ ensuring safety and transparency from manufacturers. However, in December 2019, the FDA ruled that menstrual cups were exempt from premarket notification (while the Class II classification remained in place).<sup>66</sup> The reasons behind this decision are not entirely clear, although the

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62 “Citizen Petition,” 2.

63 “Citizen Petition,” 7.

64 “Citizen Petition,” 10.

65 Max Strålin, “Classification of Medical Devices and Their Routes to CE Marking,” Clever Compliance’s Help Center, 2021, <https://support.ce-check.eu/hc/en-us/articles/360008712879-Classification-Of-Medical-Devices-And-Their-Routes-To-CE-Marking> .

66 Menstrual cups became exempt from premarket notification procedures by the FDA on 30 December 2019. Cups are regulated under US regulation § 884.5400.

following statement from the FDA suggests a combination of low health risks and a pragmatic approach to dealing with companies: ‘these exemptions will relieve manufacturers from the need to submit premarket notification submissions for these devices and will enable FDA to redirect the resources that would be spent on reviewing such submissions to more significant public health issues’.<sup>67</sup> The FDA’s 2019 decision recognized that the amount of data and documentation needed for the device did not mirror the potential risks associated with the technology, and that years of reporting had not resulted in any red flags of concern. Furthermore, documentation was often muddled. Consumers forgot brand names, confused them, used the product in ways other than instructed, or simply started feeling better after a while. In these ways, while cup technologies are transparent and informative to the user in some ways, other aspects of its materiality (specifically the problem of such a large category spanning several materials, sizes, dyes, and lengths) render it confusing to regulative bodies looking for conformity, data, and patterns across large consumer groups.

The FDA’s position is also typical of the current debate surrounding the safety and efficacy of the cup technology in countries other than the United States. Other countries have not yet regulated the cup. For instance, cups are not regulated in the European Union or in the Mooncup’s native Britain, where the Chartered Society of Physiotherapy called for manufacturers to include safety advice.<sup>68</sup> Without regulation, the cup will continue to occupy a specific place in material culture as an ‘object affiliated with the status of medical devices’.<sup>69</sup>

On the question of safety, the cup often functions as black box system in connection with the body. The menstruating body utilising a menstrual cup is one in which inputs and outputs happen without knowledge of internal workings about the interaction between cup, body, menstruation, and other factors. The body acts upon the cup by filling it with blood and holding it in place, but the cup also creates space for itself within the body, and interacts with the tissue it connects with. As in the case of tampons, cups work in conversation with the body, both biological, material, and chemical events.<sup>70</sup> In contrast to pads, which just operate as reservoirs for bodily fluids, the process of interaction between body and cup or tampon is obscured.

67 FDA, “Product Classification,” Last updated 11 August 2021, <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpd/classification.cfm?id=4119>.

68 The Society made this statement on the Victoria Derbyshire programme in March 2020, interspersed with clips about potential issues regarding cup use and pelvic organ prolapse. A BBC article about the same issue was published soon after (Anna Adams, “Menstrual cup misuse ‘can cause pelvic organ prolapse’,” BBC.co.uk, 11 March 2020), but did not specify brands or details. Mooncup replied that they agreed with the Society that cups should be regulated: “Menstrual cups and pelvic organ prolapse,” Mooncup.co.uk, March 2020.

69 Neswald, “Things That Don’t Talk Much,” 641.

70 Vostral, *Toxic Shock*.

In the public summaries, clearance letters and indications for use collected by the FDA about menstrual cups prior to 2019, information about the technological promise and problems of the devices illuminate their complex positions as black boxes.<sup>71</sup> The FDA divided issues relating to cup use into (1) practical user problems and (2) biological health issues. Like all technologies that interact with the body menstrual cups consist of a physical object and a biological human user.<sup>72</sup> The relationship between object and human can have many consequences, and the FDA listed a long list of potential interferences. In the category of physical difficulty, consumers wrote about severe discomfort, awkwardness in inserting or removing the cup, spillage and leaks, physical pain due to the cup edge or stem, and problems relating to grip and handling of the object outside the body. In terms of biological interference, users wrote about endometriosis, Toxic Shock Syndrome, yeast infections, prolapse, and severe menstrual cramps—but none of these could be linked to any single cup brand. The interplay between body and object masked any obvious correlation, making it near impossible for the FDA to decide whether or not the cup was the cause of any or some of these physical health problems. Related to the confusion was the emergence of ‘the Mooncup’ as a household name for all other cups, akin to ‘Tampax’ for tampons or ‘Kleenex’ for tissues. Consumers confused the brand names and had often thrown out original packaging after years of use. Presumably a close investigation of the object in question could help, but not all consumers sent in their cups. In several instances, consumers never replied to follow up questions from the FDA at all, perhaps as a consequence of, amongst other reasons, menstrual shame more broadly.

### **Mooncup Consumers**

The Mooncup’s brand revolved around a trio of promises: it was “safer, greener, and cheaper.” Its increasing number of consumers often considered the technology “a good thing,” and the brand (and other menstrual cups) were part of debates about menstruation, finances, and climate change.<sup>73</sup> According to the company, they ‘cracked open a new option’ where only two had previously existed before, broadening the menstrual product industry beyond the focus on pads and tampons.<sup>74</sup> The combined debates about the positive societal attributes of the cup and the cup’s

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71 FDA registration and listing database is available online: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfRL/r1.cfm>.

72 At the time of writing, it should be noted that tampon ingredients still do not have to be identified.

73 Owen, *Innovations in Menstrual Organisation*, 144.

74 Clements, interview.

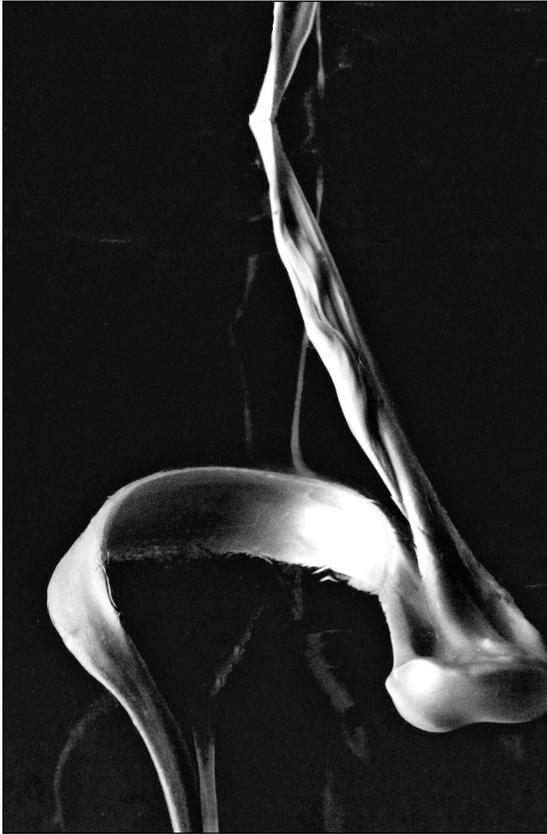


Figure 2. Jen and Rob Lewis (Beauty in Blood), Untitled #47, 2000s. To create these images the artists photographed Jen's menstrual blood while poured, dripped and swirled in water. (Attribution 4.0 International CC BY 4.0 licence. Courtesy of the Wellcome Trust Collections.)

popularity saw Mooncup grow quickly in the 2010s. With the rise of more free menstrual product policies in Britain and elsewhere, governments, charities, prisons, and schools are now approaching the Mooncup as customers with large budgets.

In the years after Mooncup was founded, their early marketing relied on punk aesthetics and guerrilla tactics. Mooncup-branded stickers could be found in the women's bathrooms in vegetarian and vegan cafes, and health food venues.<sup>75</sup> The stickers were circulated amongst consumers, who were invited to "join the revolution" by disseminating information and branding directly onto public bathroom walls and other spaces they could access.<sup>76</sup> This consumer-advertising made Mooncup a recognizable brand.

<sup>75</sup> Stevens, "People were revolted'."

<sup>76</sup> "Join the Revolution," Mooncup, 2021, <https://www.mooncup.co.uk/contact-mooncup/spread-the-word/get-stickers-and-leaflets/>.

Today, Mooncup delivers products to the British government's End Period Poverty scheme. Increasingly, it is often suggested as a solution by 'environmenstrual' activist groups such as the Women's Environmental Network.<sup>77</sup> Its success has made other brands take notice. In the late 2010s, both Procter & Gamble and Essity began producing their own silicone menstrual cups—part of a flourishing of new cup brands across the world. This was not necessarily what Mooncup and its founders had intended. Observing the growing cup market today, the company and 'environmenstrualist' NGOs are both concerned about the emergence of bleaches and colours in cup technology, as well as plastics.<sup>78</sup> With more and more products now available on the market, questions about the mass production of cups versus the carbon footprint of disposable products are also raised. And while Mooncup's founders intended to create a company that positioned itself outside the purely profit-motivated capitalist economy, the broader landscape of menstrual cup technology has mimicked many facets of late capitalism, including a competitive market, price fluctuations, aggressive promotions and advertising, largescale international trade and distribution, and a lack of transparency regarding access to facts about workers in the industry.

As such, the 2020s is a decade in which consumers have more cup choice than ever before. The Mooncup team tries to set itself apart by offering an advice service to help consumers during the three or so menstrual cycles often needed to get comfortable with using the cup. This 'learning curve' can be a make or break moment for many first time users. The resulting advice service offered by the company was born out of the understanding that sometimes users wanted medical health information and needed detailed instructions for use to successfully adopt a cup (for instance that Mooncups should not be positioned as high up in the vagina as a tampon or other cup brands).<sup>79</sup> Offering multi-lingual instructions and a direct email service, however, is expensive, which contributes to making the Mooncup less competitive on price compared to other brands. The Mooncup team, however, understands that it is in its own interest to ensure a safe and successful cup market overall, as consumers of other brands often turn to them when competitor's products fail.<sup>80</sup> In the vacuum of extensive regulation, companies like the Mooncup became authoritative voices on product safety. This is not an entirely new state of affairs: brands such as Kotex and Tampax were also important in educating and supporting first-time users through dissemination of pamphlets and films in schools.<sup>81</sup>

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77 "Women's Environmental Network," wen, 2021, <https://www.wen.org.uk/>.

78 Clements, interview.

79 Clements, interview.

80 Clements, interview.

81 Ghanoui, "From Home to School."



Figure 3. Mooncup packaging rebranded in the 2020s. (Courtesy of Mooncup®.)

### Beyond Menstrual Consumerism

People who menstruate tend to use products or material to handle blood. They have tacit knowledge and embodied experience about menstrual management.<sup>82</sup> While tampons and cups may look the same when boxed on the shelf, they do not feel the same inside the body. Users of menstrual technology become experts on the size, texture, and usefulness of tampons, pads, cups, reusable pads, and more. Since the cup is medical device-adjacent in many regions, users also connect to the cup without the presence of a medical practitioner, following in the footsteps of other medical technologies designed to give back power to users, and echoing the feminist healthcare movement begun in the 1970s.<sup>83</sup> Yet, the cup is also a commercial endeavour.

82 Neswald, “Things That Don’t Talk Much,” 645.

83 Morgen, *Into Our Own Hands*; Kline, *Bodies of Knowledge*; Murphy, *Seizing the Means of Reproduction*.

84 Neswald, “Things That Don’t Talk Much,” 644.

85 Neswald, “Things That Don’t Talk Much,” 657; 659.

86 For instance: “Menstrual Cups are Better for Earth – and Your Purse – than tampons or pads,” *Washington Post*, 10 October 2021; Jessica Matlin and Jenna Rosenstein, “It’s Time to Talk About Periods,” *Harpers Bazaar*, 24 June 2021; Salomé Gómez-Upegui, “Menstrual Cups make your Periods Easier. Why Aren’t they more Popular?,” *Guardian*, 3 August 2020; “Tackling single-use and social stigma in period management,” *Circular: For Resource and Waste Professionals*, 10 May 2021.

As connoisseurs of menstruation, consumers also contribute and observe the iconic status of some products.<sup>84</sup> Some brands, like Kotex and Tampax, are known around the world, and others barely crack a regional market. The Mooncup is increasingly gaining fame, while other cup brands are rushing into the market. As an object embedded in the social, economic, cultural, and historical contexts of menstruation, menstrual habits, and menstrual technologies, the menstrual cup is an object that “organises action” and that has taken on iconic proportions in a previously rather discreet field of entrepreneurship and public debate.<sup>85</sup>

In what ways, then, has the Mooncup brand contributed to history of menstrual technology? As a marker of significant consumer and social resistance to traditional brands it can be considered a symbol of protest. As a cultural object, the Mooncup has lent itself exceptionally well to activism and policy debates, frequently championed as a better environmental, economic, and even feminist choice.<sup>86</sup> The cup’s status as a medical device, however, remains in flux, depending on regulative systems in various regions. But as a historic object, the Mooncup’s biggest technological advantage and contribution remains the switch from rubber to silicone. The move to silicone was founded on inclusion (of those with latex allergies), and the company has remained focused on inclusion of all menstruators ever since. If, in ten years, Mooncup users are still using the same product they purchased in 2021, this would be the best measure of the durability and success of the brand.

## Biography

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